[Broxbourne Church.]

RAMBLES FROM RAILWAYS.

The Lea.—No. V.

We have gossipped so much along the first few miles that we must hasten over the remainder of our journey. We need not turn aside to Haylesbury, where is the well known College of the East India Company, in which Mackintosh and Malthus have dispensed of their learning and wisdom. Nor will we stop at St. Margaret's longer than to call attention to it as offering many choice bits of river scenery. In Stansted parish, at a short distance from the river on the Newmarket road, the rambler will see an old brick building rapidly going to decay: it is the Rye-house, the scene of the famous Rye-house plot, which led to the trial and execution of Lord William Russel and Algernon Sidney. The object of the plot was to waylay and assassinate Charles II. and his brother James on their return from Newmarket. The Rye-house was then in the occupation of Rumbold, one of the conspirators, and was fixed upon as their rendezvous, and as the most convenient place to intercept the king; but the scheme failed owing to the royal party returning sooner than the anticipated period. The project was revealed by Keeling, one of the party concerned, who said that Lord Russel was acquainted with it, and pledged to aid in the assassination of the king. We need not go on with so well known a tale. As Hallam in his 'Constitutional History of England,' observes, "there appears no cause for doubting the reality of what is called the Rye-house plot . . . . while it is needless to add that the main plot for assassinating the King and the Duke of York had no immediate connection with the schemes of Russel, Essex, and Sidney." Only a portion of the house remains, and that is rapidly crumbling away; but it will repay a close inspection. It is of brick, and about the outside there is some rather superior carving, though a good deal defaced. The principal chimney too is a very fine one. At one of the angles of the building is a turret, but the upper part has fallen in. It has been for many years used as a workhouse for Stansted parish; at present it is rented by the landlord of the New Rye-house, a little public-house just by. The interior bears all the marks of the purpose to which it has been applied. Not a vestige of ornament of any kind remains. The large old fire-places have made way for the most miserable of modern ones. Every part is covered with layers of whitewash, the accumulations of monthly applications repeated for years. The only thing of any kind in the interior of the house that will attract a second look is the winding brick staircase up the turret mentioned above, and that has somehow escaped the brush. We think it right to mention all this, because the elaborate finish of the exterior may lead the visitor to expect something in the inside very different to the poverty-stricken aspect it presents. The foundations of the house appear to be every where sapped, and the whole must soon fall.

Our river now passes a little to the east of Hoddesdon, which, if we visit it, need not detain us long. Here was the 'Thacht-house,' where Venator proposed to "drink his morning's draught;" a cottage at the northern extremity of the town is pointed out as the original, but it is doubtful if it be so. Mat. Prior in his ballad of Down Hall mentions the Bull Inn as the place where he stopt on his way to take possession of his residence of that name.

> "Into an old inn did their equipage roll
> At a town they call Hodsdon, the sign of the Bull,
> Near a nymph with an urn that divides the highway,
> And into a puddle throws mother of tea:"

he does not however praise the fare, and he says of the hostess,—

> "She roasted red veal, and she powdered red beef;
> Full well she knew how to cook up a fine dish,
> For tough were her pullets and tender her fish.
> Down, down, derry down."

But as the nymph with an urn is gone, and the inn is rebuilt, we may reasonably hope that a better purveyor now rules the roast. Hoddesdon presents not a single noticeable feature; it is one of the barrenest places of its size we know. At the London end of it, there is, indeed, a rather fine mansion (now undergoing renovation) of the Elizabethan period, called Championhouse, a seat of the Dymock family, whose chief is the *Champion* of our royal coronations.

At Stansted. the Lea is joined by the Stort, which here loses its name. The river hereabouts is a very favourite resort of the London angler, and a moderate degree of skill usually suffices to ensure a few bites,

though the Lea fisherman is apt to boast that it requires a cunning hand to obtain much success. It will be confessed that here a man may enjoy that union of contemplation and action, which, according to our master, "does most properly belong to the most honest, ingenuous, quiet, and harmless art of angling;" while should rain chance to threaten he may, like Izaak and his scholar, "turn out of the way a little, towards yonder high honeysuckle hedge; and there sit and sing whilst the shower falls so gently upon the teeming earth, and gives yet a sweeter smell to the lovely flowers that adorn these fragrant meadows."

But we must not linger. At Broxbourne, the next place we arrive at, there is a church that we will quit our river for awhile to examine. It is of large size, and of much beauty. It belongs to the time of Henry II., and consists of a nave, chancel, and aisles; at the west end there is a tower with a plain spire, and beacon turret; and a small chapel is attached to each angle of the church. That on the north side was built in the reign of Henry VIII. by Sir William Say, Knight, as appears by the inscription on the frieze surrounding the outside, and which is intersected with shields of arms. In the interior is an altar tomb of grey marble of elaborate workmanship; it is placed beneath the arch which separates it from the chancel, and is inscribed to the memory of the above Sir Wm. Say, who died in 1529, and to his "wyffs, Genevese and Elizabyth." There are several other monuments to the Say family; and many curious ones to other persons. A great number of brasses still remain, and several have been covered by the pews. Many of the monuments deserve regard as illustrative of the costumes of the period of the Tudors, as well as being curious in themselves; and altogether the church is of a more than commonly interesting character.

Broxbourne is a pretty place, and the Lea is carefully 'preserved' throughout it. Want's Inn at Broxbourne is much frequented by London anglers, and there is goodly display in it of fish stuffed on account of their superior size. Here, as at Rye-house, the London citizen may enjoy the luxury of 'chops to follow,' as well as in a city chop-house. At Wormley, a little further on, is a neat little church, consisting of only a nave and chancel. It is an old building; on the north side there is a small Norman doorway, and in the interior are several curious and very ancient brasses.

Adjoining Wormley is Cheshunt, a long village of respectable, though not particularly attractive appearance. Cheshunt has been stated to be the Durolitum of Antoninus, and the fact of a number of Roman coins, &c. having been found here, strengthens the supposition. Others, however, who have paid attention to the subject, believe Durolitum to have been at Low Layton on the other side of the Lea, and six or seven miles nearer London; while Professor Key, in the Map of Ancient Britain published by the Society for the Diffusion of Useful Knowledge, places it by Romford in Essex, ten or twelve miles from either of these places; and Talbot has fixed on Brentwood as the site: at each Roman remains have been discovered. Wolsey once dwelt in Cheshunt; the manor of St. Andrew-le-Mote having been granted to him by Henry VIII., who gave it, after Wolsey's fall, to the Earl of Worcester, and afterwards to Thomas Denny; for Henry appears to have reclaimed his gifts with as much nonchalance as he presented them. It has since passed through many hands, and was recently the property of the late Sir J. Shaw, Chamberlain of the City of London. The house is a plain brick structure, but retains little of its original character, having been frequently altered and modernized. At Cheshunt was Theobald's, the residence of the celebrated Lord Burleigh; and here Queen Elizabeth often visited her favourite minister. Not a fragment of the mansion now remains. The name alone is preserved by some houses erected on its site. Here, too, dwelt Richard Cromwell, after his return to England in 1680, in a house close by the church. He assumed the name of Clarke, and spent the remainder of his life in a round of conviviality. He was of an easy, good-natured, social turn, utterly without decision or even strength of character, and with a mind quite incapable of ambition. There are many anecdotes of his orgies while at Cheshunt, but none worth repeating. A greater statesman than Richard Cromwell—and, though not so famous, an honester than either Wolsey or Burleigh—Lord Somers, also resided at Cheshunt. And here, when excluded from any share in the government by the state of parties during the earlier years of the reign of Anne, he lived in retirement, spending his time in antiquarian and other literary pursuits, and in scientific investigation; he was, as Burnet tells us, very learned, and had formed a large collection of medals and valuable books and prints. It is pleasant to figure to oneself the noble-minded statesman thus enjoying his leisure—the true *otium cum dignitate*. On the Lea, at the northern end of Cheshunt, are some remains of a nunnery, which have been converted into a dwelling; they are not very remarkable in their appearance. Cheshunt also contains a college, established by the celebrated Countess of Huntingdon, for the training of young men for the ministry, principally in connection with the sect named after her.

A little way past Cheshunt, on the road to London, is Waltham Cross, a small hamlet that takes its name from a cross of singularly fine workmanship, erected by Edward I. to the memory of his consort Eleanor. It is of great beauty, and should not be passed by without regard. A few years back it was restored with much judgment and taste. A full description of it, with engravings, as restored, was given in No. 113 of the 'Penny Magazine;' we need not therefore dwell longer upon it now.

Near Waltham the Lea is divided into several streams which are thought by many to be the channels that Alfred formed when he diverted the waters of the Lea, and thus left the Danish fleet aground in the meadows between Waltham and Ware. Spelman, however, in his 'Life of Ælfred the Great,' endeavours to show that the trenches that now branch from the river between Temple Mills and Old Ford, and join it again by Bromley, were those he cut for that purpose. Be that as it may, the Lea here separates into a number of small streams. Several of them run through Waltham Holy Cross, a large irregular town, about a mile and a half east of the Cross above spoken of. Waltham owes its name of Holy Cross to a cross with a figure of the Saviour upon it, said to have been discovered in a vision to a carpenter at Montacute, and brought here in an unknown manner. "Tovi, a man of great wealth and authority, *stalhere*, or standard-bearer to King Cnute," built a church for the reception of this cross, and many marvellous cures were effected by its means. Edward the Confessor afterwards became possessed of Waltham, and built and endowed a monastery there. The abbey church was erected by Harold, whose body, after his death at the battle of Hastings, was brought here for interment. The abbey has undergone some strange changes, but this is not the place for tracing its history, which indeed would take up no little space to tell at all properly. Of the abbey only a small portion now exists—that used as the present parish-church, and a gateway by the Lea, of which we give a sketch (*Fig. 7*). It stands a short distance from the Abbey Mills, and is built of stone, but repaired with bricks of a large size. The corbels on which the outer mouldings of the large arch rest, are formed by "demi-angels sup-

porting shields, on which are the royal arms of Edward the Third's time, viz. France and England quarterly." These, however, are so much defaced as to be made out with difficulty. The abbey buildings are said to have originally covered several acres.

It would take up too much of our time to attempt to describe the church, and there are so many descriptions of it extant that it is needless. There are few churches anywhere that will more amply repay examination, both as regards the interior and exterior. It is perhaps the earliest and most curious example of Anglo-Norman architecture now remaining in England. There are a great many windows, doorways, and arches that deserve attention, and inside are several massive columns curiously carved. There is too a remarkably fine crypt. The interior also contains several interesting monuments. As we mentioned above, the body of Harold was interred here, and a tomb with the inscription "*Hic jacet Harold Infelix*" long remained in memory of him. It was opened in the reign of Elizabeth, and the skeleton of a man found inside. Some notion of the original size of the church may be formed when we find it stated that "Harold's tomb was situated about forty yards from the present termination of the building, in the eastern part of the original choir." A full History of Waltham Abbey (though not perhaps an entirely trustworthy one) is appended by Fuller to his 'Church History.'* Fuller was curate of Waltham, and repeats with much delight some of the merry tales he had collected about the monks of Waltham—who seem indeed to have been pretty much like those of Melrose the ballad speaks of. Henry VIII. had a pleasure-house in the fields near Waltham, and there is an uncommon number of right pleasant stories told of him there, but we have so outrun our space we must not repeat any of them. Along the various branches of the Lea about Waltham are scattered extensive gunpowder works belonging to the government; but it must be confessed they add very little to the beauty of the neighbourhood.

On our left the high grounds stretching to Epping Forest offer us some tempting walks: and many a pleasant stroll may be found over these hills and among the woods beyond. Epping Forest is not what it was—so many of the larger trees have been cut down as greatly to interfere with its character as a forest: yet there are not a few quiet secluded spots such as a Londoner would glory to meet with. But is not Epping Forest classic ground with every genuine cockney? Where is its Fairlop fair? Or shall its Easter hunt ever be forgotten? Alas! all that is earthly fades away. The fair is obsolescent; and of even the Epping hunt the glory is departing. In a few years Cruikshank's cuts will alone remain to tell of the assembled host of cockney equestrians and city belles —of the daring feats of horsemanship, and the strange adventures of that day—"so renowned, so glorious."

On the other side of our river we soon reach Enfield Wash; and shortly after Edmonton, to whose churchyard we must turn aside, for here, "in a spot which, about a fortnight before his death, he had pointed out to his sister, on an afternoon wintry walk, as the place where he wished to be buried,"* lie the remains of Charles Lamb, the *Elia* who has thrown so many pleasant memories over so many every-day circumstances and objects. On a plain upright stone is the following inscription by his friend Dr. Carey, the translator of Dante:—

"To the Memory of Charles Lamb,
Died December 27, 1834, aged 59.

"Farewell, dear Friend! that smile, that harmless mirth
No more shall gladden our domestic hearth;
That rising tear, with pain forbid to flow,
Better than words no more assuage our woe;
That hand, outstretched from small but well-earned store,
Yield succour to the destitute no more.
Yet art thou not all lost; through many an age,
With sterling sense and humour shall thy page
Win many an English bosom, pleased to see
That old and happier vein revived in thee.
This for our earth: and if with friends we share
Our joys in heaven, we hope to meet thee there." †

Charles Lamb lived for many years in this neighbourhood, first at Enfield, and then, till the close of his life, at Edmonton. His last days were not his happiest. He hated the country, and even Edmonton was not enough like London to satisfy him. He had spent his whole life laboriously, and though he had been for years longing for leisure, he found it a weariness when it came. His letters, written after he had retired from his office, are filled with complaints, in his half-mocking manner indeed, but evidently too real, of the misery of having too much time. He was a man of kindly affections, beloved to an uncommon degree by all who knew him; and in literature we shall in vain look for his successor in that rich, racy, quirkish, half-jesting, half-serious style, so peculiarly his own.

[Abbey Gates, Waltham.]

* Farmer also wrote a 'History of Waltham Abbey,' and the reader will find much additional information in Morant's 'Essex,' and in Brayley; we ought not in gallantry to omit the name of Mrs. Elizabeth Ogborne, who, in her 'History of Essex,' gossips famously about Waltham. Its architectural features are examined at considerable length in Britton's 'Architectural Antiquities.'

* Talfourd.

† We heard a piece of criticism on this inscription that Lamb would have enjoyed. As we were copying it, a couple of canal excavators came across the churchyard, and read it over with great deliberation; when they had finished, one of them said, "A very fair bit of poetry that;" "Yes," replied his companion, "I'm blest if it isn't as good a bit as any in the churchyard—rather too long though."

Punch in Paris.—Punch is, if possible, more popular here than in London. It is quite extraordinary the number of people who assemble to witness his vagaries. Places are taken as if to see a grand performance, and most respectable persons watch the movements of the actor with the greatest interest.—*Impressions and Observations of a Young Person resident in Paris.*

[The figures from the Monument of Lorenzo de' Medici at Florence.]

ESSAYS ON THE LIVES OF REMARKABLE PAINTERS.—No. XXVI.

MICHAEL ANGELO: b. 1474; d. 1564.

WE have spoken of Lionardo da Vinci. Michael Angelo, the other great luminary of art, was twenty-two years younger; but the more severe and reflective cast of his mind rendered their difference of age far less in effect than in reality. It is usual to compare Michael Angelo, with Raphael, but he is more aptly compared with Lionardo da Vinci. All the great artists of that time, even Raphael himself, were influenced more or less by these two extraordinary men, but they exercised no influence on each other. They started from opposite points; they pursued throughout their whole existence, and in all they planned and achieved, a course as different as their respective characters. It would be very curious and interesting to carry out the comparison in detail; to show the contrast in organization, in temper, in talent, in taste, which existed between men so highly and so equally endowed, but our limits forbid this indulgence. We shall therefore only observe here, that considered as artists they emulated each other in variety of power, but that Lionardo was more the painter than the sculptor and architect; Michael was more the sculptor and architect than the painter. Both sought true inspiration in nature, but they beheld her with different eyes: Lionardo, who designed admirably, appears to have seen no *outline* in objects, and laboured all his life to convey by colour and lights and shade the impression of beauty and the illusive effect of rotundity. He preferred the use of oil to fresco, because the mellow smoothness and transparency of the vehicle was more capable of giving the effects he desired. Michael Angelo, on the contrary, turned his whole attention to the definition of form, and the expression of life and power through action and movement; he regarded the illusive effects of painting as meretricious and beneath his notice, and despised oil-painting as a style for women and children. Considered as men, both were as high-minded and generous as they were gifted and original, but the former was as remarkable for his versatile and social accomplishments, his love of pleasure and habits of expense, as the latter for his stern inflexible temper, and his temperate, frugal, and secluded habits.

Michael Angelo Buonaroti was born at Settignano, near Florence, in the year 1474. He was descended from a family once noble—even amongst the noblest of the feudal lords of northern Italy—the Counts of Canossa; but that branch of it represented by his father, Luigi Lionardo Buonaroti Simoni, had for some generations become poorer and poorer, until the last descendant was thankful to accept an office in the law, and had been nominated magistrate or mayor (*Podestà*) of Chiusi. In this situation he had limited his ambition to the prospect of seeing his eldest son a notary or advocate in his native city. The young Michael Angelo showed the utmost distaste for the studies allotted to him, and was continually escaping from his home and from his desk to haunt the atteliers of the painters, particularly that of Ghirlandajo, who was then at the height of his reputation, and of whom some account has been already given.

The father of Michael Angelo, who found his family increase too rapidly for his means, had destined some

of his sons for commerce (it will be recollected that in Genoa and Florence the most powerful nobles were merchants or manufacturers); and others for civil or diplomatic employments. But the fine arts, as being at that time productive of little honour or emolument, he held in no esteem, and treated these tastes of his eldest son sometimes with contempt and sometimes even with harshness. Michael Angelo, however, had formed some friendships among the young painters, and particularly with Francesco Granacci, one of the best pupils of Ghirlandajo; he contrived to borrow models and drawings, and studied them in secret with such persevering assiduity and consequent improvement that Ghirlandajo, captivated by his genius, undertook to plead his cause to his father, and at length prevailed over the old man's family pride and prejudices. At the age of fourteen Michael Angelo was received into the studio of Ghirlandajo as a regular pupil, and bound to him for three years; and such was the precocious talent of the boy, that instead of being paid for his instruction, Ghirlandajo undertook to pay the father, Lionardo Buonaroti, for the first, second, and third years, six, eight, and twelve golden florins, as payment of the advantage he expected to derive from the labour of the son. Thus was the vocation of the young artist decided for life.

At that time Lorenzo the Magnificent reigned over Florence. He had formed in his palace and gardens a collection of antique marbles, busts, statues, fragments, which he had converted into an academy for the use of the young artists, placing at the head of it as director a sculptor of some eminence named Bertoldo. Michael Angelo was one of the first, who, through the recommendation of Ghirlandajo, was received into this new academy, afterwards so famous and so memorable in the history of art. The young man, then not quite sixteen, had hitherto occupied himself chiefly in drawing; but now, fired by the beauties he beheld around him, and by the example and success of a fellow pupil, Torregiano, he set himself to model in clay, and at length to copy in marble what was before him; but, as was natural in a character and genius so steeped in individuality, his copies became not so much imitations of form as original embodiments of the leading idea, and Lorenzo de' Medici, struck by his extraordinary power, sent for his father and offered to attach the boy to his own particular service, and to undertake the entire care of his education. The father consented, on condition of receiving for himself an office under the government, and thenceforth Michael Angelo was lodged in the palace of the Medici and treated by Lorenzo as his son.

Such sudden and increasing favour excited the envy and jealousy of his companions, particularly that of Torregiano, who being of a violent and arrogant temper, while that of Michael Angelo was by no means conciliating, sought every means of showing his hatred. On one occasion a quarrel having ensued while they were at work together, Torregiano turned in fury and struck his rival a blow with his fist which disfigured him for life. His nose was flattened to his face, and Torregiano, having by this "sacrilegious stroke," gratified his hatred, was banished from Florence.

It is fair, however, to give Torregiano's own account of this incident as he related it to Benvenuto Cellini, many years afterwards. "This Buonaroti and I, when we were young men, went to study in the church of the Carmelites, in the chapel of Masaccio; it was customary with Buonaroti, to rally those who were learning to draw there. One day, among others, a sarcasm of his having stung me to the quick, I was extremely irritated, and doubling my fist gave him such a violent blow on the nose that I felt the bone and cartilage yield as if they had been made of paste, and the mark I then gave him he will carry to his grave."

Thus it appears that the blow was not unprovoked, and that Michael Angelo, even at the age of sixteen, indulged in that contemptuous arrogance and sarcastic speech which, in his mature age, made him so many enemies;—but to return.

Michael Angelo continued his studies under the auspices of Lorenzo: but just as he had reached his 18th year he lost his generous patron, his second father, and was thenceforth thrown on his own resources. It is true that the son of Lorenzo, Piero de Medici, continued to extend his favour to the young artist, but with so little comprehension of his genius and character, that on one occasion he set him to execute a statue of snow for the amusement of his guests.

Michael Angelo, while he yielded, per force, to the caprices of his protector, turned the energies of his mind to a new study—that of anatomy—and pursued it with all that fervour which belonged to his character. His attention was at the same time directed to literature, by the councils and conversations of a very celebrated scholar and poet, then residing in the court of Lorenzo, Angelo Poliziano; and he pursued at the same time the cultivation of his mind, and the practice of his art. Engrossed by his own studies, he was scarcely aware of what was passing around him, nor of the popular intrigues which were preparing the ruin of the Medici; suddenly this powerful family were flung from sovereignty to temporary disgrace and exile; and Michael Angelo, as one of their retainers, was obliged to fly from Florence, and took refuge in the city of Bologna. During the year he spent there he found a friend, who employed him on some works of sculpture; and, on his return to Florence, he executed a Cupid, in marble, of such beauty, that it found its way into the cabinet of the Duchess of Mantua, as a real antique. On the discovery that the author of this beautiful statue was a young man of two-and-twenty, the Cardinal San Giorgio invited him to Rome, and for some time lodged him in his palace. Here Michael Angelo, surrounded and inspired by the grand remains of antiquity, pursued his studies with unceasing energy: he produced a statue of Bacchus, which added to his reputation; and the group of the dead Christ on the knees of his Virgin Mother (called *the Pietà*), which is now in the church of St. Peter's at Rome:* this last, being frequently copied and imitated, obtained him so much applause and reputation, that he was recalled to Florence, to undertake several public works, and found himself once more established in his native city about the year 1504.

CASTS FROM MEDALS AND MEDALLIONS.

THERE have been many different modes practised of taking casts from medals, coins, and other small articles having a device in relief. The recent progress of electro-metallurgy seems to afford ground for thinking that casts in copper or other metal, through the medium of moulds made also of metal, will become the

* This 'Pietà' is the only work whereon Michael Angelo inscribed his name, which he has carved distinctly on the girdle of the Virgin. The circumstance which induced him to do this is curious. Some time after the group was fixed in its place, he was standing before it considering its effect, when two strangers entered the church, and began, even in his hearing, to dispute concerning the author of the work, which they agreed in exalting to the skies as a masterpiece. One of them, who was a Bolognese, insisted that it was by a sculptor of Bologna, whom he named. Michael Angelo listened in silence, and the next night, when all slept, he entered the church, and by the light of a lantern engraved his name, in deep indelible characters, where it might best be seen.

most easily executed of all, and more durable than most others. The principal methods employed may be here briefly described.

The moulds are made of sulphur, of plaster of Paris, of wax, or of horn. The first of these is in very general use, from the ease with which the mould is made; but it is defective for fine specimens, from two or three circumstances: the sulphur is liable to injure a medal, and the fine lines of the device are seldom brought out clearly and sharply in the mould. The medal or coin is generally oiled before the mould is made from it; and as this oil is liable to flow down in little pools to the cavities of the medal, this is in itself sufficient to injure the sharpness of the mould taken from it; and there is also a liability of the melted sulphur becoming cold before it reaches these depressed parts. To avoid the inconvenience resulting from the use of oil, it has been recommended to use some kind of oily composition that shall not flow into the cavities too fully.

That sulphur moulds can, however, be taken from medals or small objects with great delicacy, in the hands of a clever artist, was shown some few years ago by Mr. Francillon, an eminent jeweller. He possessed an invaluable rosary, formed of nectarine stones, and engraved by the celebrated Florentine artist Benvenuto Cellini. Each of these stones had either the head of a Roman emperor or of a pope, most exquisitely carved on one side of it; while on the other side was a carved representation of a triumphal arch, a public building, or some other object. From these small but precious specimens Mr. Francillon was accustomed to take casts in plaster, through the medium of sulphur-moulds. His mode of procedure was as follows:—He first encircled each bead or model with a border formed of paper or pasteboard, and rising to a greater height than the most prominent part of the model. A small quantity of sulphur was then melted in a suitable vessel, and brought to that condition where it assumes a thick consistency and a brown colour; then, allowing it to cool down to the limpid state of a liquid (which is one of the peculiarities of this substance), it was poured into the cell containing the model, the latter having been previously oiled to prevent adhesion. When cold the sulphur was removed from the pasteboard border, the model was taken out of it, and it then formed a mould of the object. From this mould casts were taken in plaster of Paris. It was moistened with a mixture of oil and rum, and was encompassed by a pasteboard border, as the model had before been. A mixture was then made of fine new plaster of Paris and raw terra sienna, brought to a liquid state by thin gum-water; and this being poured gently into the mould, it was blown strongly upon, in order to make it fill the hollows and drive out all the air-bubbles. When the plaster had become hard, the rim of cardboard was removed, and replaced by another of greater thickness, which formed a permanent strengthening rim for the plaster cast. In this way all the beads of the rosary were imitated.

Plaster casts of medals are sometimes taken from plaster moulds. In this case the mould requires to be very plentifully oiled, in order to yield a clear and fine cast; and even when quite saturated with oil, it does not always prevent adhesion between the mould and the cast. The following has been recommended as one mode of preventing this adhesion, viz. to dip the plaster mould into melted wax, and allow it to remain till the wax has well penetrated into the plaster; then, when about to be used, the surface of the mould is to be moistened with wax dissolved in spirit of turpentine; and after a lapse of a quarter of an hour, the mould will be ready for the reception of the plaster.

A mould of wax is for many purposes deemed preferable to one of sulphur or of plaster, but requires much care and attention in the preparation. A ledge or border is formed round the medal, as before, either of paper, pasteboard, or lead from a tea-chest. This is bound round close to the edge of the medal, and made to project half an inch or so above it. The wax is put into a cup, and the cup immersed in boiling water, so that the wax becomes melted through the medium of the cup, which cannot be raised to a higher heat than that of boiling water. The wax being melted, and the medal slightly warmed and oiled, the wax is poured quickly into the cell surrounding the medal. When cold the edge or border is stripped off; and if the medal can be removed easily from the mould thus formed, it is so; but if not, it is slightly warmed on a heated plate, by which the two are made easily separable. To cast from this mould, it is only requisite to surround it with a border, and to pour in liquid plaster in the same way as was before noticed; but if there are many deep cavities in the mould, the plaster is worked into them by the aid of a camel-hair pencil.

A method was some years ago practised in France, whereby moulds or reverse copies of medals were made in horn. A piece of horn, such as is used by the comb-makers, was worked out even and flat, and polished on one side. It was cut square, a little larger than the medal, and was then ready to be acted on by heat. Two thick flat plates of iron, rather larger than the piece of horn, were heated to a degree which would soften without burning the horn. One of these was laid upon the bed of a press; two or three pieces of thick moistened pasteboard were laid upon it; the medal was placed upon the pasteboard, having that side uppermost which was to be copied, and which was oiled for that purpose; the piece of horn was laid, polished side downwards, upon the medal; and at the top of all was placed the other heated plate of iron. The press was then worked gradually, first to bring the various pieces into close contact, then to press them on one another with a slight force; and then, as the horn became softened by the heated iron plates, to make the pressure powerful. By this softening and pressure, the substance of the horn was driven into all the minute devices of the medal; and in order to retain the effect thus produced, the pressure was continued for twenty-four or thirty hours. When the plates and the horn had been thus allowed to cool gradually, and to remain under pressure so long, the horn was found to assume the form of a hollow mould of the medal, sharp and well defined; specimens have been described, in which the hair and other extremely minute details of a medal have thus been copied in horn with the utmost exactness and delicacy. From a horn mould, thus made, casts could be taken in plaster.

Impressions of medals are occasionally taken in glue. To effect this, a little isinglass glue is melted with brandy, and poured thinly over the medal, so as to cover its whole surface. This is allowed to remain for a day or two, by which time it becomes thoroughly dry and hardened; and when taken from the medal, the film of glue presents a fine, clear, thin, and hard copy of the medal, somewhat similar in appearance to a piece of talc. A copy from the medal, made in this way, is not calculated to serve as a mould from which further impressions may be taken, but forms in itself the duplicate of the medal. Glue moulds are, however, occasionally made, formed of the common glue, and poured on the medal in the same manner as sulphur or plaster would be, so as to lie on the medal in a considerable body; this method is serviceable when the object to be copied is much under-cut, and therefore requires considerable elasticity in the substance of the mould in order that the object may be removed from it.

Casts from moulds are made occasionally of bread. For this purpose a piece is taken from the "crumb" or inner part of a new loaf, and thoroughly kneaded in the hand, till it acquires a consistency soft enough to take an impression, but not so soft as to adhere to the medal. In this state it is pressed carefully on the medal so as to come in contact with it in every part; and afterwards the bread is cut into any convenient form. Some years ago a fashion was in vogue for making bread seals by these means; but the mode is a very imperfect one.

By far the most valuable and important method of copying a medal is that which has recently arisen from the astonishing discoveries in electro-metallurgy. Here no press is required, nor a crucible or furnace, and yet the most beautiful copies of medals may be procured in gold, silver, copper, and several other metals. The scientific principles on which the method rests are too complicated to be dwelt on fully here, but a few explanations may suffice.

When chemical bodies are brought to act on each other under certain conditions, a galvanic current is occasioned, which, some years ago, was regarded only as a scientific phenomenon, but has now become available as a motive power for telegraphs, clocks, carriages, and other contrivances. Thus, if a piece of copper and a piece of zinc be dipped into weak acid, and they be connected by a piece of dry wire, the difference of the action of the acid on the two metals gives rise to a current of electricity. From this germ successive stages of improvement have resulted, one of which consists in making the current deposit a thin layer of metal in the course of its circuit, and thus has arisen the new art of electro-metallurgy.

One form of the apparatus now employed, applicable to the copying of medals, will give a sufficient idea of the general character of the arrangement. A cylindrical vessel is provided, in which is placed a smaller cylindrical vessel, made of porous earthenware. In the outer vessel is placed a solution of a metallic salt; in the inner one is a piece of zinc, immersed in a weak acid solution. The medal or object from which the impression is to be taken, is fastened at one end of a piece of wire, the other end of which is attached to the piece of zinc within the inner vessel. Here is the whole apparatus, for nothing more is necessary to induce the generation of an electrical current, which current causes the deposition on the medal of a thin film of metal from the solution in the outer vessel.

There are two points to be here taken into consideration; viz., the nature of the metallic solution, and the nature of the substance on which the precipitation takes place.

If the metal to be deposited is copper (the most usual in common experiments) the solution employed is that of a sulphate of copper; and the galvanic action, by separating the copper from the sulphuric acid, with which it is combined, deposits the former on the medal or other object contained in the solution. Most of the other metals, in order to be deposited in a similar manner by galvanism, require more delicacy of management than is consistent with familiar experiments; but success has been attained with gold, silver, platinum, rhodium, nickel, iron, tin, lead, antimony, and several other metals.

As to the substance on which the deposit takes place, this may either be the metal itself, or a mould taken from the medal; and this mould may be of wax, or stearine, or plaster of Paris, or of many other substances. But, in the latter case, there must be some kind of metallic surface given to it, or the deposition will not take place. If the cast is to be an exact copy of the medal, there must, of course, be a mould first made; although this mould might itself be made of metal, deposited by the electro process, yet as a valuable medal might be injured in the process, it is generally preferred to make the mould of wax, plaster, or some other material, in the way before described; and then to take a cast from this by the electric agency.

When the mould for copying is prepared, it is coated with a fine and delicate layer of black-lead, and is in that state fitted to be introduced into the apparatus. A film of copper gradually forms on the mould, and this film may be increased to any desired thickness by allowing the action to continue for a sufficient time. On separating the copper from the mould, the former is found to be an exact counterpart of the original medal, having all the lines, projections, and cavities which distinguished the medal. Indeed, it results from the nature of the process, that no other mode of copying can approach so near as this to absolute correctness.

So rapidly has this new and interesting art progressed, that the necessary apparatus is now prepared on a very economical scale, and sold at prices to suit the varying means of the experimenters. At the shops of the philosophical instrument-makers, and at the Polytechnic Institution, small sets of apparatus are sold, accompanied by cheap directions for managing this very pretty process.

ON THE TERMS STANDARD, STERLING, AND CARAT.

It is perhaps generally known, though not universally, that the current coins of the realm are not made of pure gold or silver; since the silver coins contain a little copper, while the gold coins contain a little silver or copper, or both mixed. The maintenance of a given relation between the quantity of the cheap metal and of the costly metal, under the name of the *standard*, is connected with some interesting points in the past history of English coinage.

If coins were made of pure gold or pure silver, they would be too flexible to bear the wear to which they are afterwards subjected; and hence the practice of mixing with them a certain proportion of harder metal, which is called *alloy* or *allay*. In all regular governments there has been a *standard* for coins fixed by law; and this standard is so expressed as to indicate the proportions between the respective metals employed. Thus the legal standard for gold coin in England is expressed by the fraction $\frac{11}{12}$, or more commonly $\frac{22}{24}$. This implies that out of every twenty-four parts by weight of standard gold coin, twenty-two consist of pure gold, and the remaining two of alloy (generally silver and copper mixed). In the customary language of goldsmiths, refiners, and bullion-dealers, standard gold is said to be "twenty-two carats fine," a phrase somewhat unintelligible to other persons, but which is to be understood as follows:—"Fine" may be taken as equivalent to "pure," and implying pure or unadulterated gold; and the "twenty-two" as implying that there are twenty-two parts of pure or "fine" gold in twenty-four parts of the standard. But the term "carat" has a little history of its own, rather curious in its character.

The *carat* (or, as it is sometimes spelled, *caract*, *carract*, *carrat*, *harract*, and *harrat*) is both a real weight and an imaginary weight. In the former sense it is the weight used in weighing diamonds, pearls, and precious stones; it is equal to about $\frac{1}{152}$th part of a troy ounce, or to about $3\frac{1}{2}$ troy grains; it is divided into halves, and these halves into quarters or grains; while the grains themselves are so subdivided as to yield the eighth, the sixteenth, and the thirty-second parts of a carat, so important is a minute difference of weight in precious stones. In the other sense of the word *carat*, it expresses the degree of fineness of gold, and is

therefore imaginary so far as real weight is concerned, since it expresses *proportion*, without reference to the quantity tested. The whole mass of gold, whether it be a pennyweight, an ounce, or a pound, is supposed to be divided into twenty-four parts or carats; this twenty-four is placed as the denominator of a fraction, of which the numerator expresses the number of parts of pure gold. Pure gold is considered as $\frac{24}{24}$, or "twenty-four carats fine." The melters at the Mint have a curious series of terms to represent the fractional part of these carats; but it may be sufficient to say that one-fourth of the carat is called a *grain*. In Germany the carat is divided into twelve parts; and in France into thirty-two.

The origin of the name *carat* is rather singular. Mr. Ruding, in his 'Annals of the Coinage,' quotes Bruce as an authority for this origin; and on referring to Bruce's 'Abyssinia,' we find the following details. He gives a plate of an Abyssinian plant called the *kuara*, and thus describes it:—"This beautiful tree is the production of the south and south-west parts of Abyssinia. It is very frequent, and, with the ebony, almost the only wood of the province of Kuara, of which it bears the name; indeed in all Fazuclo, Nuba, and Guba, and the countries where there is gold. It is here designed in its natural size, both leaves, flowers, and fruit; the whole so plainly, that it is needless to descant upon its particular parts, well known to naturalists. It is what they call a *corallodendron*, probably from the colour of its flowers or of its fruit, both equal in colour to coral. Its fruit is a red bean, with a black spot in the middle of it, which is enclosed in a round capsula, or covering of a woody nature, very tough and hard. This bean seems to have been in the earliest ages used for a weight of gold among the Shangalla, where that metal is found, all over Africa; and by repeated experiments I have found that, from the time of its being gathered, it varies very little in weight, and may perhaps have been the very best choice that therefore could have been made between the collectors and the buyers of gold. I have said this tree is called *kuara*, which signifies the sun. The bean is called *carat*, from which is derived the manner of esteeming gold as so many carats fine. From the gold country in Africa it passed to India, and there came to be the weight of precious stones, especially diamonds; so that to this day in India we hear it commonly spoken of gold or diamonds, that they are of so many carats fine or weight. I have seen these beans likewise from the West India Islands: they are just the same size, but, as far as I know, are not yet applied to any use there." ('Travels,' vol. v., p. 65.)

In the standard for silver coins the word carat is not often used. The proportion which the pure silver bears to the whole weight is that of 222 to 240, or 37 to 40; that is, there are three parts of copper alloy to thirty-seven parts of pure silver, in forty parts of standard silver. It is a very remarkable circumstance, and illustrative of the permanency of some of our commercial usages, that this was the precise standard for silver adopted in England more than six hundred years ago, in the reigns of John and of Edward I. There was a silver coinage for Ireland in the reign of Edward III., when the standard was reduced from $\frac{37}{40}$ to $\frac{29}{40}$, that is, there was a smaller quantity of pure silver than before by $\frac{1}{40}$ in a given weight of the standard. But this was recovered; and, much to the honour of the country, the standard of silver remained untouched throughout the troubled scenes of the subsequent reigns for many centuries. From the latter end of Henry VIII.'s reign to the beginning of that of Elizabeth, the standard was in a lower state; but it recovered again in England, and reached its old proportion of $\frac{37}{40}$. In Ireland, however, the standard has varied to a most extraordinary degree, insomuch that there has been occasionally more than three times as much copper as silver in the so-called silver coins, or $\frac{58}{240}$, that is, only 58 parts of pure silver in 240 of standard.

The variation of the standard may or may not be dishonest, according to the attendant circumstances. As the copper is added to the silver, and the copper and silver added to the gold, merely for the purpose of making the coins more durable, any proportion may be adopted which is deemed most durable, provided the coin is to circulate universally throughout the country at a fixed and recognised value, depending on the amount of precious metal in it. But if a needy or unscrupulous sovereign tampered with the standard for his own purposes, he did that which was a positive fraud on his subjects; and such a project has been resorted to in many countries in times of trouble.

[To be continued.]

Great Men and National Greatness.—Twice in history has there been witnessed the struggle of the highest individual genius against the resources and institutions of a great nation; and in both cases the nation has been victorious. For seventeen years Hannibal strove against Rome; for sixteen years Napoleon Buonaparte strove against England: the efforts of the first ended in Zama, those of the second in Waterloo. True it is, as Polybius has said, that Hannibal was supported by the zealous exertions of Carthage; and the strength of the opposition to his policy has been very possibly exaggerated by the Roman writers. But the zeal of his country in the contest, as Polybius himself remarks in another place, was itself the work of his family. Never did great men more show themselves the living spirit of a nation than Hamilcar, and Hasdrubal, and Hannibal, during a period of nearly fifty years, approved themselves to be to Carthage. It is not then merely through our ignorance of the internal state of Carthage that Hannibal stands so prominent in all our conceptions of the second Punic war: he was really its moving and directing power; and the energy of his country was but a light reflected from his own. History therefore gathers itself into his single person: in that vast tempest, which from North and South, from the West and the East, broke upon Italy, we see nothing but Hannibal. . . . . As Hannibal utterly eclipses Carthage, so, on the contrary, Fabius, Marcellus, Claudius Nero, even Scipio himself, are as nothing when compared to the spirit, and wisdom, and power of Rome. The Senate, which voted its thanks to its political enemy Varro, after his disastrous defeat, "because he had not despaired of the Commonwealth," and which disdained either to solicit, or to reprove, or to threaten, or in any way to notice the twelve colonies which had refused their accustomed supplies of men for the army, is far more to be honoured than the conqueror of Zama. This we should the more carefully bear in mind, because our tendency is to admire individual greatness far more than national; and as no single Roman will bear comparison with Hannibal, we are apt to murmur at the event of the contest, and to think that the victory was awarded to the least worthy of the combatants. On the contrary, never was the wisdom of God's providence more manifest than in the issue of the struggle between Rome and Carthage. It was clearly for the good of mankind that Hannibal should be conquered: his triumph would have stopped the progress of the world. For great men can only act permanently by forming great nations; and no one man, even though it were Hannibal himself, can in one generation effect such a work. But where the nation has been merely enkindled for a while by a great man's spirit, the light passes away with him who communicated it; and the nation, when he is gone, is like a dead body, to which magic power had for a moment given an unnatural life; when the charm has ceased, the body is cold and stiff as before. He who grieves over the battle of Zama should carry on his thoughts to a period thirty years later, when Hannibal must in the course of nature have been dead, and consider how the isolated Phœnician city of Carthage was fitted to receive and to consolidate the civilization of Greece, or by its laws and institutions to bind together barbarians of every race and language into an organized empire, and prepare them for becoming, when that empire was dissolved, the free members of the commonwealth of Christian Europe.—*Arnold's History of Rome.*